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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/511,715

03/25/2005

Hideo Hosono

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07/25/2008

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EXAMINER

VADEN, KENNETH I

ART UNIT

PAPER NUMBER

4162

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/511,715	Applicant(s) HOSONO ET AL.	
	Examiner KENNETH VADEN	Art Unit 4162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2 and 3 is/are allowed.
- 6) ☒ Claim(s) 1 and 4-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/18/08 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/18/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of in the reply filed on claim 11 is acknowledged. The traversal is on the ground(s) that Groups I and III satisfy the combination of categories provided under 37 CFR 1.475(b)(3) and satisfy unity of invention.
2. This is not found persuasive because in unity of invention practice, restriction is proper in a US national stage of a PCT application where the special specification technical feature does not make a contribution over the prior art. In this application, the compound of claim 1, which is the special specification technical feature, is taught by the prior art and therefor does not make a contribution over the prior art. Therefore restriction of claim 11 is proper.

The requirement is still deemed proper and is therefore made FINAL.

Oath/Declaration

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: the foreign priority claimed block is not checked.

Claim Rejections - 35 USC § 102 and 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1 and 4-7 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lacerda et al., Solid State Ionics, 59 (1993), pages 257-262.

5. Regarding claim 1, Lacerda "59" teaches the use of a $12 \text{ CaO} \cdot 7 \text{ Al}_2\text{O}_3$ compound. Lacerda "59" (page 258 para. 3 lines 1-5 and Fig 2) teaches exposing the compound to an atmosphere of 5% hydrogen and 95% nitrogen with temperatures at 800 degrees C and below. (The present specification teaches (page 6 lines 17-20 and page 7, lines 9-12) that exposing $12 \text{ CaO} \cdot 7 \text{ Al}_2\text{O}_3$ to a combination of hydrogen concentration of 1,000 ppm or more and temperature of 800 degrees C or less results in incorporating a negative hydrogen ion concentration of $1 \times 10^{18} \text{ cm}^{-3}$ or more).

6. Further, by exposing $12 \text{ CaO} \cdot 7 \text{ Al}_2\text{O}_3$ compound to an atmosphere of 5% hydrogen (which exceeds 1,000 ppm hydrogen) and temperatures less than 800 degrees C, the compound after exposure to the atmosphere and temperature would obviously have a negative hydrogen ion concentration in the range of $1 \times 10^{18} \text{ cm}^{-3}$, as claimed.

7. Regarding claim 4, it would have been obvious to one of ordinary skill in the art at the time of the invention that Lacerda would have also had his compound have the same range of conductivity since the temperature of 800 degrees C and atmosphere exceeding 1,000 ppm of hydrogen gas were used in his work.

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8. Regarding claim 5, in Lacerda "59" the $12 \text{ CaO} \cdot 7 \text{ Al}_2\text{O}_3$ compound is exposed to an atmosphere of 5% hydrogen (which exceeds 1,000 ppm hydrogen) and temperatures less than 800 degrees C, which results in a compound which would exhibit a sustained increase in electronic conductivity if exposed to irradiation with ultraviolet ray or X-ray.

9. Regarding claim 6, Lacerda "59" (and the present specification) teaches the use of temperatures 800 degrees C and below and the use of an atmosphere consisting of 5% hydrogen gas (page 258, para 3, lines 1-5 and Fig. 2), thus providing an ionic conductance derived from negative hydrogen ion. (The present specification teaches the use of this temperature and hydrogen concentration of 1,000 ppm or more to create an ionic conductance derived from the negative hydrogen ion (H^- , H^{2-} , H_2^-). Further, it would have been obvious to one skilled in the art at the time of the invention that Lacerda would have shown an ionic conductance derived from the negative hydrogen ion since the $12 \text{ CaO} \cdot 7 \text{ Al}_2\text{O}_3$ compound is exposed to an atmosphere of 5% hydrogen (which exceeds 1,000 ppm hydrogen) and temperatures less than 800 degrees C.

10. Regarding claim 7, Lacerda "59" a method of producing the compound consisting of $12 \text{ CaO} \cdot 7 \text{ Al}_2\text{O}_3$ using a heat treatment at a temperature less than 800 degrees C in an atmosphere containing 5% hydrogen gas which correlates to more than 1,000 ppm or more of hydrogen gas (page 258 para. 3 lines 1-5 and Fig 2). (The present specification teaches (page 6 lines 17-20 and page 7, lines 9-12) that a combination of hydrogen concentration of 1,000 ppm or more and temperature of 800 degrees C or less, the negative hydrogen ion concentration would be $1 \times 10^{18} \text{ cm}^{-3}$ or more.).

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Further, since Lacerda used 5% hydrogen which exceeds 1,000 ppm and temperatures less than 800 degrees C, the compound after exposure to the atmosphere and temperature would obviously have a negative hydrogen ion in the compound in the range of $1 \times 10^{18} \text{ cm}^{-3}$ as claimed.

Claim 5 rejected under 35 U.S.C. 103(a) as being unpatentable over Lacerda "59" as applied to claim 1 above in view of Hayashi, et al., Nature, Vol. 419, No. 6906, pp. 462-465, 3 Oct., 2002.

Regarding claim 5, Hayashi teaches an increase of electrical conductivity by means of irradiation of $12 \text{ CaO} \cdot 7\text{Al}_2\text{O}_3$, doped with negative hydrogen ions, with ultraviolet light (page 463, lines 15-28). It would be obvious to one of ordinary skill in the art at the time of the invention to use ultraviolet light to increase the electrical conductivity of the compound, as taught by Hayashi et al.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Allowable Subject Matter

11. Claim 2 is allowed. There is no prior art which teaches the compound $12 \text{ SrO} \cdot 7 \text{ Al}_2\text{O}_3$ which incorporates a negative hydrogen ion concentration of 1×10^{18} or more in the compound.

Claim 3 is allowed. There is no prior art that teaches the mixed compound $12 \text{ CaO} \cdot \text{Al}_2\text{O}_3$ and $12 \text{ SrO} \cdot 7 \text{ Al}_2\text{O}_3$ which incorporates a negative hydrogen ion concentration at a concentration of $1 \times 10^{18} \text{ cm}^{-3}$ or more.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENNETH VADEN whose telephone number is (571)270-5824. The examiner can normally be reached on Monday - Thursday 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571 272 1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KV

July 21, 2008

/Melvin C Mayes/

Primary Examiner, Art Unit 1791